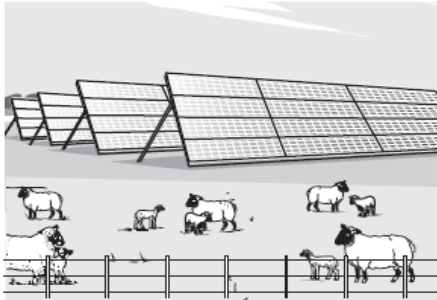


GCSE Physics B (Twenty First Century Science)
J259/02 Depth in physics (Foundation Tier)

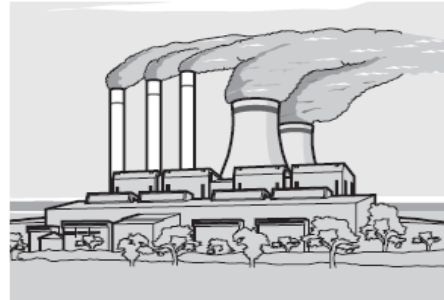
Question Set 4

1

Solar farms are large power stations made up from many photovoltaic (PV) panels. Even though they are now very common, most of Britain's electricity is generated by burning gas.



A solar farm



A gas-burning power station

(a) Here are some data about these two types of power station.

| Type of power station | Solar farm | Gas-burning |
|-----------------------|------------|-------------|
| Power output (MW) | 35 | 1400 |

(i) Calculate the number of solar farms that would be needed to give the output power of this gas-burning power station.

$$\frac{1400}{35} = 40$$

Number of solar farms = 40 [2]

(ii) In the table, the 35 MW power of the solar farm is the **maximum** power it can produce.

Give **two** reasons why the output power is often less than 35 MW.

Solar panels don't work at night and less power is generated when it is cloudy. [2]

(b)* Jane and Ben have different views about these power stations.



Jane

Solar farms look ugly and take up a lot of space. Their output power is really small. A gas-burning power station provides much more power. Making the PV panels is very polluting, so it's not as green as people say.

Ben

Gas is not renewable. It produces carbon dioxide when burnt which is damaging for the environment.



Describe the **advantages** and **disadvantages** of both power stations using Jane and Ben's views.

[6]

Solar Farms

Advantages

- Less pollution and no CO₂ produced so better for the environment.
- It is renewable so it will not run out.

Disadvantages

- Ugly and they take up space.
- Produces 40x less power.
- Solar panel production is polluting.
- Reliant on the weather.

Gas burning power station

Advantages

- Produces 40x more power than solar farms.
- Gas is not reliant on weather conditions / light levels.

Disadvantages

- Gas is non-renewable so it will run out (finite).
- It produces CO₂, which contributes to climate change and damages the environment.

Total Marks for Question Set 4: 10

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